

–17–

CLAIMS

1. A transporter and storage unit comprising:

an elongated vehicle frame having a front and a rear interconnected by elongated opposite sides;

ground engaging means on said frame whereby said frame may traverse the underlying terrain;

at least two movable elongated object supports extending forwardly from said rear on at least one of said sides above said frame, said object supports being movable between positions overlying said frame and positions substantially engaging the underlying terrain;

a pair of parallelogram linkages for each of said object supports, each having long links and short links, and having pivots at corresponding ends of said links and interconnecting the same;

a first two of said pivots of each linkage of each pair being pivoted to a part of said frame defining one of said short links or to a short link joined to said frame, said first two pivots for the linkages of each pair being aligned with one another; and

–18–

18 a second two of said pivots of each linkage of each pair being pivoted to
a part of a corresponding one of said object supports defining a second one of
said short links or to a short link joined to said object support, said second two
20 pivots for the linkages of each pair being aligned with one another.

2. The transporter and storage unit of claim 1 wherein both said object
2 supports are located to the same side of said frame and the long links of one
of said pairs are longer than the long links of the other of said pairs.

3. The transporter and storage unit of claim 1 wherein one of said object
2 supports is located to one of said opposite sides and the other of said object
supports is located to the other of said opposite sides.

4. The transporter and storage unit of claim 1 further included extendible
2 motors, one for each linkage, extending generally between opposite ones of
one of said first two pivots and one of said second two pivots.

–19–

5. The transporter and storage unit of claim 1 further including object
2 support rests on said frame engageable by said object supports when said
object supports are in a position overlying said frame.

6. The transporter and storage unit of claim 1 wherein there are four said
2 object supports, two located to one of said opposite sides and two located to
the other of said opposite sides.

7. The transporter and storage unit of claim 6 wherein the two object
2 supports on each of said sides are vertically separated, one being higher on
said frame than the other when both are in said position overlying said frame.

8. The transporter and storage unit of claim 7 wherein lowermost ones of
2 said object supports are shorter than uppermost ones of said object supports
and each said pair of linkages includes a linkage located at each end of the
4 corresponding object support, said first two pivots of one linkage being shared
by the other linkage at the corresponding ends of the object supports located
6 to the same opposite side of said frame.

-20-

9. The transporter and storage unit of claim 8 where the long links of the
2 pair of linkages connected to the uppermost object support when the object
supports are overlying said frame are longer than the long links of the pair of
4 linkages connected to the lowermost object support when the object supports
are overlying said frame.

10. The transporter and storage unit of claim 9 wherein there is an
2 extendible fluid motor interconnecting two opposite corners of each said
linkage.

11. The transporter and storage unit of claim 1 wherein each object support
2 includes an end plate at each end thereof and each said end plate defines a
short link to which said second two pivots are attached.

12. The transporter and storage unit of claim 11 wherein each said object
2 support includes a plurality of bars extending between its end plates and
defining a support for articles to be transported or stored.

–21–

13. A transporter and storage unit comprising:

2 an elongated vehicle frame having a front and rear interconnected by
elongated opposite sides;

4 ground engaging means on said frame whereby said frame may traverse
the underlying terrain;

6 two movable elongated cradles extending forwardly from said rear on
each of said sides above said frame, said cradles being movable between
8 positions overlying said frame with one cradle on each side additionally
overlying the other cradle on the same side, and positions substantially
10 engaging the underlying terrain;

a pair of parallelogram linkages for each of said cradles, each having
12 long links and short links, and having pivots at corresponding ends of said links
and interconnecting the same;

14 the long links for said one cradles being longer than the long links for
said other cradles;

16 a first two of said pivots of each linkage of each pair being pivoted to a
part of said frame defining one of said short links or to a short link joined to said
18 frame, said first two pivots for the linkages of each pair being aligned with one
another; and

-22-

20 a second two of said pivots of each linkage of each pair being pivoted to
a part of a corresponding one of said cradles defining a second one of said
22 short links or to a short link joined to said cradle, said second two pivots for the
linkages of each pair being aligned with one another.

14. The transporter and storage unit of claim 13 wherein said first two pivots
2 of one linkage on each side of said frame are shared by the other linkage on
the same side of said frame at the corresponding ends of said frame.

15. The transporter and storage unit of claim 13 wherein said long links of
2 each linkage are formed of channels opening toward each other and further
including extendible motors, one for each linkage, extending generally between
4 opposite ones of one of said first two pivots and one of said second two pivots.

16. Apparatus comprising:
2 a frame including two spaced cross members connected to one another
by at least one elongated stringer, said elongated stringer(s) having an upper,
4 relatively low, support surface;

–23–

a generally centrally located upright element extending upwardly from
6 each of said cross member and terminating in an upper, relatively high support
surface;

8 a plurality parallelogram linkages, each having two relatively short links
with four first linkages having relatively long links and four second linkages
10 having intermediate length links to respectively provide four linkages having
said relatively long links connected by pivots at their ends to said relatively short
12 links and four linkages having said intermediate length links connected by pivots
to said relatively short links to respectively form said first and second linkages;

14 each of said cross members mounting one of said first linkages and one
of said second linkages on each side of said upright element at one of said
16 relatively short links with said first linkages being outermost and said second
linkages being innermost;

18 four cradles each having spaced end plates interconnected by at least
one support member, said end plates each defining one of said relatively short
20 links;

stub shafts extending from said end plates to define those of said pivots
22 connecting said relatively long links and said intermediate length links to the
short links defined by said end plates;

–24–

24 said relatively long links having lengths such that cradles mounted to
said first linkages are movable between positions substantially engaged with
26 terrain underlying said frame and resting on said relatively high support
surfaces;

28 said intermediate length links having a length so that cradles mounted
to said second linkages are movable between positions substantially engaged
30 with terrain underlying said frame and resting on said relatively low support
surface; and

32 motors for independently moving said cradles between said positions.

17. The apparatus of claim 16 wherein said relatively long links and
2 intermediate length links are formed of channels which open toward each other
and said motors are fluid cylinders extending between opposite ones of said
4 pivots in each linkage, said cylinders being housed by said channels when the
corresponding cradle is resting on its support surface.

18. The apparatus of claim 16 wherein each said at least one support
2 member comprises a plurality a generally parallel, spaced bars interconnecting
the associated end plates.